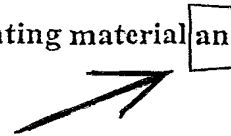


Device and method for encapsulating with encapsulating material an electronic component fixed on a carrier



The present invention relates to a device for encapsulating with encapsulating material an electronic component, in particular a semiconductor, fixed on a carrier, comprising: two co-acting mould parts which are displaceable relative to each other between an encapsulating position, in which the mould parts, when closing onto the carrier, occupy a position for defining at least one mould cavity, and an opened position in which the mould parts are situated at a greater distance from each other than in the encapsulating position, and feed means for encapsulating material connecting onto the mould cavity. The invention also relates to a method for encapsulating with encapsulating material an electronic component, in particular a semiconductor, fixed on a carrier.

The encapsulating of an electronic component fixed on a carrier is a technique applied on a large scale, particularly in the production of semiconductors. More and more emphasis is being placed on the use of low-lead or lead-free soldering material on the carrier, which has less of an environmental impact but which has the drawback that it must be processed at higher temperatures than lead-containing soldering materials. This is a drawback at the position where the encapsulating material must later be released from the soldering material. One solution herefor is feeding of an encapsulation via a separating element at the position where the carrier has to remain free of encapsulating material. Such a technique is known from, among others, the international patent application PCT/NL00/00458. In the method and device described in this publication use is made of a holder member which is displaceable between the mould parts of an encapsulating device and with which an edge of a carrier can be urged against one of the mould parts, whereupon the feed of encapsulating material takes place over the holder member. The thus proposed technique functions effectively but requires a complex construction of the device. Because of the load on the plunger housing (sleeve), it has to take a sufficiently sturdy form and a displacing mechanism therefor also has to be fitted. In addition, there is a real possibility of loss of adhesion (delamination) of the carrier and the encapsulating material connecting onto the carrier at locations where this loss of adhesion is undesirable when the holder member is displaced after the encapsulating process to a position where the carrier can be taken out

**COMBINED DECLARATION AND POWER OF ATTORNEY**

As a below named inventor, I hereby declare that:

My residence, mailing address and citizenship are as stated below next to my name.

I believe the inventor(s) named below to be the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

DEVICE AND METHOD FOR ENCAPSULATING WITH ENCAPSULATING MATERIAL   
ELECTRONIC COMPONENT FIXED ON A CARRIER  
(Invention Title)

the specification of which:

☐ is filed concurrently herewith.

OR

☐ was filed as U.S. Application No. \_\_\_\_\_ on \_\_\_\_\_ (mm/dd/yyyy) and was amended on \_\_\_\_\_ (mm/dd/yyyy).  
(if applicable)

OR

☒ was filed as PCT International Application No. PCT/NL2004/000005 on 01/06/2004 (mm/dd/yyyy) and was amended under PCT Article 19 on \_\_\_\_\_ (mm/dd/yyyy) and/or PCT Article 34 on \_\_\_\_\_ (mm/dd/yyyy).  
(if applicable) (if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claim(s), as amended by any amendment referred to above.

I do not know and do not believe that the invention was ever known or used in the United States before my invention thereof; or patented or described in any printed publication in any country any time by others before my invention or by anyone more than one year prior to this application; or in public use or on sale in the United States by anyone more than one year prior to this application.

I do not know and do not believe that the invention has been patented or caused to be patented, or was the subject of an inventor's certificate, by me or my legal representatives or assigns in any country foreign to the United States on a patent application or inventor's certificate filed more than twelve months, or six months for a design application, prior to the filing date in the United States of this application.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, §1.56.

Utility (NOT Claiming Benefit to Provisional Application)  
or Design Application

Application Serial No. \_\_\_\_\_

Attorney Docket No. \_\_\_\_\_

I hereby claim foreign priority benefits under Title 35, United States Code, §119(a)-(d) or (f), or §365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or §365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

PRIOR FOREIGN APPLICATION NO.	COUNTRY	FOREIGN FILING DATE (mm/dd/yyyy)	PRIORITY NOT CLAIMED	CERTIFIED COPY ATTACHED?	
1022323	NL	01/08/2003	<input type="checkbox"/>	YES <input type="checkbox"/>	NO <input type="checkbox"/>

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

APPLICATION NO.	FILING DATE
PCT/NL2004/000005	01/06/2004

I hereby appoint the practitioners associated with

**Customer Number 28289**

to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith.

**Please send all correspondence to Customer Number 28289.**

**Please direct all telephone calls to John W. McIlvaine, at telephone number (412) 471-8815.**

The law firm of **WEBB ZIESENHEIM LOGSDON ORKIN & HANSON, P.C.** whose address is 700 Koppers Building, 436 Seventh Avenue, Pittsburgh, Pennsylvania 15219-1818, Telephone No. 412-471-8815 has been assigned Customer Number 28289 by the United States Patent and Trademark Office.

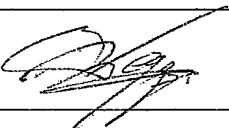
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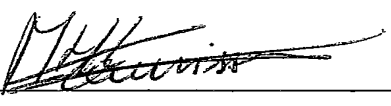
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

1.

FULL NAME OF INVENTOR Martin Herman Weggen	
INVENTOR'S SIGNATURE 	DATE 2-Dec-2005
RESIDENCE Anijsveld 2, 7006 VP Doetinchem	
COUNTRY OF CITIZENSHIP The Netherlands	
MAILING ADDRESS	

2.

FULL NAME OF INVENTOR Michel Hendrikus Lambertus Teunissen	
INVENTOR'S SIGNATURE 	DATE 14 SEPT 2005
RESIDENCE Kettingpol 15A, 6914 BB Herwen	
COUNTRY OF CITIZENSHIP The Netherlands	
MAILING ADDRESS	

\* Before signing this declaration each person signing must:

1. Review the declaration and verify the correctness of all information therein; and
2. Review the specification and the claims, including any amendments made to the claims.

Checked Box indicates \_\_\_\_\_ additional page(s) for inventor signatures.

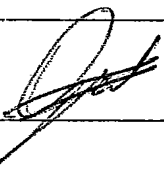
☐

Utility (NOT Claiming Benefit to Provisional Application)  
or Design Application

Application Serial No. \_\_\_\_\_

Attorney Docket No. \_\_\_\_\_

3.

FULL NAME OF INVENTOR Wilhelmus Gerardus Jozef Gal	
INVENTOR'S SIGNATURE 	DATE 14-9-05
RESIDENCE Beekseweg 2, 7031 AX Kilder	
COUNTRY OF CITIZENSHIP The Netherlands	
MAILING ADDRESS	

4.

FULL NAME OF INVENTOR	
INVENTOR'S SIGNATURE	DATE
RESIDENCE	
COUNTRY OF CITIZENSHIP	
MAILING ADDRESS	

5.

FULL NAME OF INVENTOR	
INVENTOR'S SIGNATURE	DATE
RESIDENCE	
COUNTRY OF CITIZENSHIP	
MAILING ADDRESS	

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